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(56) Documents Cited
US 6119229 A   US 6117011 A
US 5984787 A   US 20010039211 A1
US 20010031654 A1

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General internet keyword searching

(54) Abstract Title
Playing a virtual game tournament in a network, e.g. a wireless LAN

(57) A gaming device 12A allows a game entity 46 to be engaged in, controlled during, and disengaged from, a game provided by a network, e.g. a wireless LAN, with entity 46 only being disengaged from the game under certain conditions not including loss of communications between the device and the network. Whilst entity 46 is engaged in a game, device 12A operates to either not engage the entity in a second game with another network, or not treat the second game as a valid game. Entity 46 may remain engaged in the valid game after loss of communications between the device and network, with the entity being in a dormant state during which it cannot be interacted with. Device 12A may include means 61, 62 for storing game entity attributes which determine characteristics of the entity during respective valid and non-valid tournament games, with means to modify the attributes in response to experiences of the game entity in a valid game or non-valid game respectively. Apparatus for playing a virtual game, including status means for indicating whether a game entity is currently disengaged from any game, is also claimed.
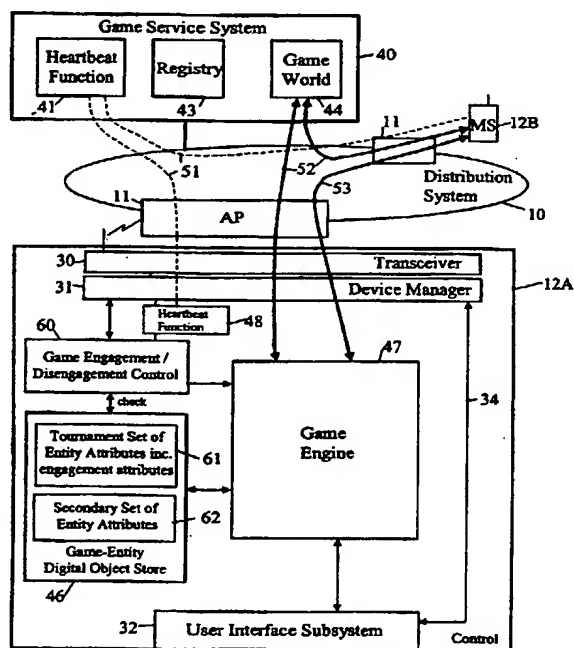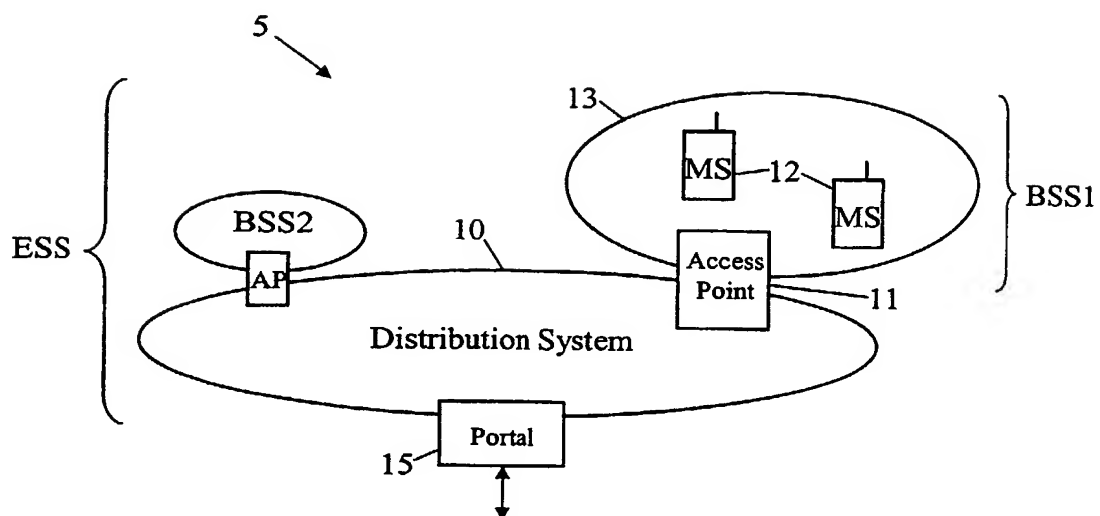
Figure 3

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Figure 1

(PRIOR ART)

Game Service System

Heartbeat Function	Registry	Game World

41   43   44   40

11

MS   12B

52

51

Distribution System

53

11

AP

10

30   Transceiver

31   Device Manager   12A

Heartbeat Function   48

45

Game Engagement / Disengagement Control

47

Game Engine

34

Game-Entity Digital Object Store

46

32   User Interface Subsystem

Control

Figure 2

Figure 3

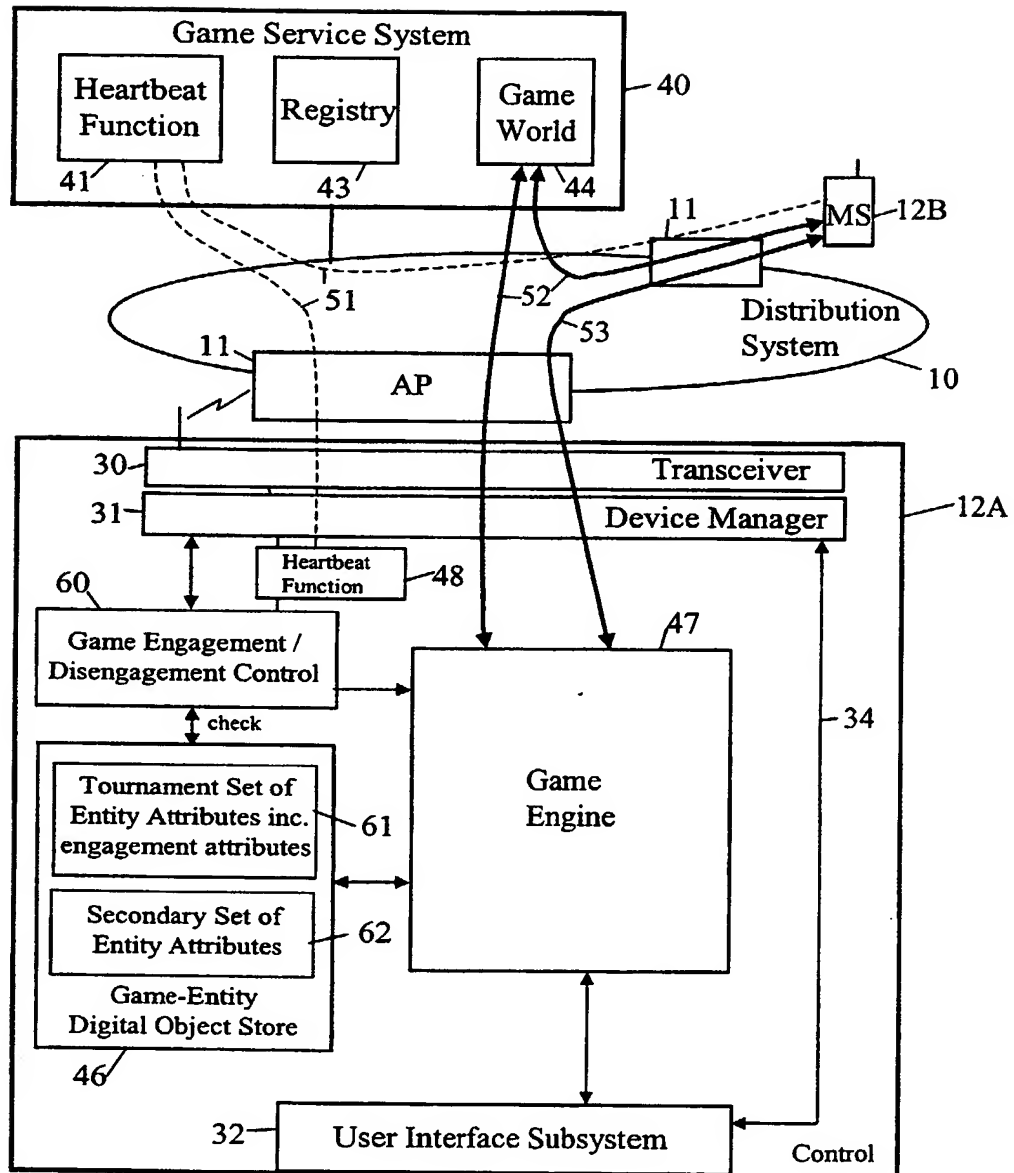## Virtual Game Tournament Arrangement

Field of the Invention

5   The present invention relates to a virtual game tournament in which a virtual game entity stored locally in a player device can be engaged in a succession of virtual games involving different external game systems.

Background of the Invention

10   Wireless LANs are gaining substantial acceptance as a means for providing connectivity over a restricted area to mobile devices. Whilst there are a number of different wireless LAN architectures and the present invention is not limited to any particular one (or, indeed to wireless LANs), the following description is generally written using the terminology applied in the ANSI/IEEE Standard 802.11 ("Wireless LAN Medium Access Control and

15   Physical Layer Specifications"). More particularly, Figure 1 of the accompanying drawings illustrates the main components of a wireless LAN using that terminology. Thus, a typical wireless LAN 5 comprises a distribution system 10 that serves to interconnect a number of access points (AP) 11 via a network. Each access point 11 connects with mobile stations (MS) 12 over a wireless medium to form a Basic Service Set 13 (BSS1 and BSS2). The

20   totality of the basis service sets and the network that interconnects them is called an Extended Service Set (ESS). The wireless LAN may connect with other networks via a portal 15. The term "wireless LAN core" is used herein to refer to the permanent infrastructure of a wireless LAN, namely its distribution system with associated wireless access points, and any functional systems connected to the distribution system (such as, for

25   example, storage systems).

Wireless LANs can be used to provide connectivity over limited areas such as public spaces and publicly-accessible premises, both commercial and non-commercial. By connecting service systems to the distribution system network, a variety of services can be

30   made available via a wireless LAN independently of any external network connection. Such services can enhance the experience of persons with mobile stations (also called devices below) in the coverage zone of the wireless LAN. Indeed, the availability of such

services can be a strong incentive for people to frequent the coverage zone. This can be used by premises wishing to attract people. For example, a coffee shop wanting to attract younger customers can make available virtual games hosted to a greater or lesser extent by a game service system of a wireless LAN set up to cover substantially only the coffee shop

5 (at least in terms of the coverage offered by the access points of the wireless LAN).

However, the playing of a one-off virtual game may not be adequate incentive to attract customers back to a premises, particularly when other premises are also offering virtual games via their wireless LANs. Tournaments (that may be open-ended) between game

10 players using game entities customised by each player can offer additional attraction particularly if games can be played in more than one environment, for example in a game world created by a wireless LAN game service system and in a peer-to-peer space only involving two player devices. However, such a tournament needs to be conducted fairly.

15 It is an object of the present invention to facilitate the proper running of a virtual game tournament.

Summary of the Invention

According to one aspect of the present invention, there is provided an arrangement for

20 enabling a virtual game entity to be engaged in a succession of virtual games that are valid games of a game tournament, the arrangement comprising:

- a player device for enabling a player to communicate with external game systems to engage a locally-stored virtual game entity in a game, control it during the game and disengage it from the game;

25 - a network-based external game system with which the player device can communicate to engage the game entity in a valid tournament game from which it can only be disengaged under certain conditions not including cessation of communication between the device and the network-based system;

the player device being operative whilst the game entity has not been disengaged from a

30 valid tournament game involving the network-based system, either not to engage said game entity in a different game with another external system or not to treat that game as a valid tournament game.

According to another aspect of the present invention, there is provided apparatus for playing a virtual game comprising:

- storage means for storing a set of attributes for a virtual game entity;

5 - control means for enabling a user to engage said virtual game entity in a game, control it during the game and disengage it from the game;

- communication means for communicating with different external systems to enable the game entity to be engaged in respective games involving those systems, at least one said external system providing in cooperation with the control means of the

10 apparatus a game in which said game entity can only be disengaged from the game under certain conditions not including cessation of communication between the apparatus and that external system;

- status means for indicating whether said game entity is currently disengaged from any game; and

15 - attribute-modifying means for modifying said attributes in response to experiences of said game entity in a game that was engaged in only after the game entity had been disengaged from any earlier-engaged game.

Brief Description of the Drawings

20 Embodiments of the invention will now be described, by way of non-limiting example, with reference to the accompanying diagrammatic drawings, in which:

. **Figure 1**   is a diagram of a known wireless LAN architecture;

. **Figure 2**   is a diagram of a first embodiment of the invention; and

. **Figure 3**   is a diagram of a second embodiment of the invention.

25

Best Mode of Carrying Out the Invention

The wireless LAN shown in Figure 2 comprises a wireless LAN core formed by distribution system 10, access points 11 and a game service system 40 connected to the distribution system 10. Mobile devices 12A and 12B of the wireless LAN are in

30 communication with the wireless LAN core through the access points 11 (though not necessarily directly).
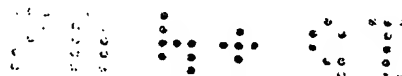
The game service system 40 of the wireless LAN core provides a game environment for playing a virtual game involving virtual game entities (typically, human or robot characters) controlled through respective mobile player devices 12A, 12B in wireless communication with the service system 40. The virtual game entities are represented by

5 digital objects that each contain the entity attributes necessary to characterise the entity; typically these attributes will comprise permanent (or semi-permanent) attributes that specify the game entity and variable attributes that represent depletable resources such as energy, lives, weapons etc.

10 The game-entity digital objects are locally stored in an object store 46 of their respective associated mobile devices 12A, 12B. The game entities can not only be used for games played in the environment provided by the game service system 40, but also for games outside of this environment such as peer-to-peer games between two mobile devices.

15 As illustrated for the mobile device 12A, each mobile device comprises, in addition to the game-entity object store 46, a transceiver 30, a user interface 32, and a device manager 31 providing basic control functions for the mobile device in response to user input from subsystem 32 (arrow 34) and input received via the transceiver 30. Each mobile device further comprises a game engine 47, a game engagement/disengagement control block 45

20 and a heartbeat function 48.

The role of the control block 45 is to permit a locally-stored game entity to be enrolled in a virtual game tournament and then to ensure that this game entity is only engaged in valid games of the tournament. To enrol a game entity in a game tournament, the mobile device

25 is used to connect with the game service system 40 whereupon the control block 45 interacts with a registry function 43 of the service system to register the game entity for the tournament. Qualification for registration may involve the registry 43 receiving a copy of the game-entity digital object for inspection, a satisfactory game entity object then being returned along with a tournament ID (for security, the non-variable attributes of the entity

30 object, including the tournament ID, can be digitally signed by the registry).

The control block 45 then operates only to permit the registered game-entity object to be engaged in valid tournament games with other tournament-registered game entities in

qualifying environments (including that provided by the service system 40); the presence of only tournament-registered entities and of a qualifying environment are necessary but not sufficient conditions for the control block 45 to permit the registered game entity to be engaged in a game. In particular, the control block operates to impose the further condition

5   that the game entity must not already be engaged in a game when attempting to engage in another game.

In the present embodiment, disengagement of a game entity from a game is treated differently for the game run by the game service system and games run on a peer-to-peer

10   basis. More particularly, the disengagement of a game entity from the game run by the game service system requires certain game conditions to be satisfied that may include the game entity achieving a particular goal in the game such as reaching a particular location, finding a particular game object, or defeating a particular enemy; however, cessation of communication between the mobile device and game system is specifically not a condition

15   leading to the game entity of the mobile device being treated as disengaged from the game. In contrast, for peer-to-peer games, cessation of communication between the devices concerned is taken as disengagement of the entities involved from the game (although this need not be the case for all embodiments).   .

20   Considering in more detail how a tournament-registered entity is engaged, modified and disengaged from the game run by the game service system 40, it is assumed that the game entity has been disengaged from any other game. The mobile device is first used to contact the registry 43 of the game service system whereupon the control block 45 confirms with the registry 43 that the game being run by the service system is a qualifying game involving

25   only other tournament-registered entities (which would normally be the case). If this check is satisfactory, the control block 45 next requests that its tournament-registered entity, identified by its tournament ID, be engaged in the game being run by the service system. Upon acceptance of this engagement request, the registry 43 notifies the control block 45 accordingly and the latter sets an engagement status attribute of the game entity object to

30   indicate that the entity is now involved in a game; in addition, it also sets an entity attribute to indicate whether, for the current game, disengagement is to be triggered by cessation of communication between the mobile device and primary cooperating game system (that is,
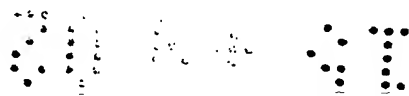
the service system for a game run by the latter, and the peer device for a peer-to-peer device).

The control block 45 now informs the game engine 47 that it is to use the tournament-
5   registered game entity in a game involving the game service system, the game engine thereupon fetching the game entity attribute data required from store 46.

The virtual game world in which the game entities move and interact with each other during a game involving the game service system 40, is generated by a game world
10   subsystem 44 of the game service system. The game-world subsystem is also responsible for keeping track of the game entities in the game world. The game-world subsystem 44 passes game-world display data to the game engines 47 of the mobile devices 12A, 12B controlling game entities in the game (see arrows 52), the display data sent to a game engine 47 being dependent on the position of the corresponding game entity as determined
15   in dependence on movement data sent by the game engines to the game-world subsystem. When the game-world subsystem 44 determines that two game entities are within an interaction distance of each other, it informs the corresponding game engines 47 and thereafter interaction of the game entities is controlled by the exchange of data between the game engines via the wireless LAN (see arrow 53).
20
The game engines 47 are responsible for modifying the values of the variable attributes of their corresponding game entities and for producing a suitable output via user interface subsystem 32 showing how the game entity is doing in the game world.

25   The registry 43 is arranged to determine when a game entity can be disengaged on the basis of input from the game world subsystem, only allowing (or forcing) disengagement under the appropriate conditions. Upon the registry determining disengagement of a game entity from a game, it informs the control block 45 of the relevant mobile device which thereupon resets the entity attributes it set upon engagement in the game (including, in particular the
30   engagement status attribute).

Whilst the game entity remains engaged in the service-system game, the control block 45 is
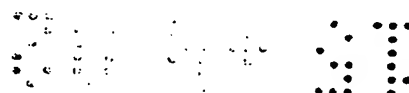
operative to prevent the user engaging the game entity in any other game (this involves the control block checking the engagement status attribute of the entity before allowing any game engagement request to be made).

5 The game service system 40 includes a heartbeat function 41 which exchanges regular heartbeat signals, in both directions, with the corresponding functions 48 in the mobile devices (see dashed arrows 51) whereby to provide both a periodic check for the service system that it is still in communication with each device and a similar check for each device that it is still in communication with the service system. Should the heartbeat

10 between the service system and a mobile device be lost, the following actions are taken (it being understood that loss of the heartbeat in one direction causes the non-receiving heartbeat function to cease to transmit back to the corresponding remote function whereby both functions register a loss of heartbeat). At the service system, the registry records that the mobile device concerned has become inactive but still retains the game entity

15 concerned as engaged in the game, though now in a dormant state in which, at least for a predetermined period, other game entities cannot interact with it (the entity can, for example, also be made invisible). At the mobile device that has lost the heartbeat, the heartbeat function informs the control block 45 which checks the attributes of the game entity to determine whether this loss of communication is to cause disengagement of the

20 game entity from the game; in the present case, the entity is required to remain engaged. The control block 45 therefore does not change the engagement status attribute but informs the game engine 47 to effect any final updates to the attributes of the entity and then to terminate its operation.

25 The above-described arrangement ensures that the user must disengage their game entity in an appropriate manner from the service-system game before engaging in another game (merely ceasing communication with the game system being inadequate to disengage the game entity). A further guarantee of this would be for the game service system to store a continually updated copy of the game entity object (together with the ID of the related

30 mobile-device or user) whilst the game entity was engaged in the game, the control block 45 being arranged to delete the game-entity object from the store 46 if the heartbeat signal was lost whilst the game entity is engaged in a game. As a result, the mobile device ceases
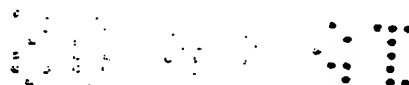
to store the object and needs to re-connect to the game system to continue the game, re-connection resulting in the copy of the game-entity object stored in the game system being downloaded back into the store 46 of the mobile device.

5   Provision may also be made at the service system (particularly if the game system holds the only copy of the game entity object), for the game service system to "capture" a game entity object that has been left engaged in the game for a prolonged period; by capture is meant that the game entity object ceases to be treated as associated with the mobile device / user that engaged it in the game.

10

Assuming that the mobile device does re-establish communication with the service system, continues the game, and satisfies the conditions for disengaging the game entity from the game, the game entity becomes available for engagement in another game. For example, the tournament-registered game entity may next be registered in a peer-to-peer game with

15   another mobile device (assuming all appropriate conditions regarding valid tournament games are satisfied). In this case, the control block 45 again sets the engagement status attribute of the game entity to indicate its engagement in a game but this time it sets the communication-cessation action attribute to indicate that loss of heartbeat exchange with the other device is to be taken as disengagement from the game. Other disengagement

20   possibilities are also likely to be provided by the game rules. Again, the setting of the engagement status attribute prevents the user engaging the game entity in another game whilst still engaged in the peer-to-peer game.

From the foregoing, it can be seen that the tournament-registered game entity can be

25   engaged in a series of games during which it can build up a score (measured in any suitable terms such as victories won) enabling it to be ranked with other tournament-registered entities. To this end, each time the mobile device connects with the service system, the score of its tournament-registered game entity is preferably uploaded to the service system and a ranking generated against the latest scores known for the other registered entities.

30

The tournament can be open-ended or limited in an appropriate way, for example by time or by the number of games each registered entity is allowed to play (with respect to the
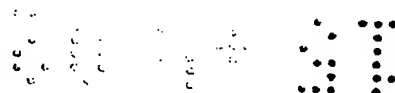
latter, the control block would need to be arranged to store a count of games played as an attribute of the entity and then only allow a new game if the game limit had not been reached for the entity).

5   Since an objective of providing the game service system may be to attract customers to a commercial premises, the game service system is preferably designed as a real focus for the tournament by providing an enticing game environment relative to that provided by a peer-to-peer game. Thus, the game environment provided by the service system is designed to serve as a main arena (indeed, it can be visually presented as such).

10

It should be noted that tournament games can be permitted on more than one network-based game service system, even to the exclusion of peer-to-peer only games. Furthermore, it is not necessary that any game service system be associated with a wireless LAN though at least one service system should be network based.

15

Where the store 46 contains game entities additional to the tournament-registered game entity, then the control block does not apply the same tournament related conditions to the engagement and disengagement of those entities in a game.

20   The Figure 3 arrangement is similar to that of Figure 2 with the exception that now a game entity can have multiple versions 61, 62 of its attributes (either stored in respective digital objects in store 46 or consolidated into one object in store 46 to share invariant entity attributes). In particular, the game entity can have both a tournament-registered version 61 that the control block 45 causes only to be used for valid tournament games (whereby its

25   attributes are updated by the game engine only for such games), and a second version 62 (and possibly others versions) that is not tournament registered and can be used for any game that is not tournament valid, including a game which, for example, would qualify as a valid tournament game were not the tournament-registered version of the game entity already engaged in a tournament game.

30

It will be appreciated that many other variants are possible to the above described embodiments of the invention. For example, the game service system can be provided with

a game engine powerful enough to process all game entity interactions; in this case, the game entity object of each game entity involved in the service-system game is copied to the service system upon engagement of the entity in the game and all game processing is done at the service system. The game entity object can be arranged to be removed from the

5 mobile device concerned whilst the game entity was engaged in the service-system game, the game entity object being restored upon disengagement of the game entity from the game. In order to support stand-alone peer-to-peer games, each mobile device would still be provided with a game engine 47.

CLAIMS

1. An arrangement for enabling a virtual game entity to be engaged in a succession of virtual games that are valid games of a game tournament, the arrangement comprising:

5   -   a player device for enabling a player to communicate with external game systems to engage a locally-stored virtual game entity in a game, control it during the game and disengage it from the game;

  -   a network-based external game system with which the player device can communicate to engage the game entity in a valid tournament game from which it

10   can only be disengaged under certain conditions not including cessation of communication between the device and the network-based system;

the player device being operative whilst the game entity has not been disengaged from a valid tournament game involving the network-based system, either not to engage said game entity in a different game with another external system or not to treat that game as

15 a valid tournament game.

2. An arrangement according to claim 1, further comprising further player devices each constituting a said external system.

20 3. An arrangement according to claim 1, wherein said valid tournament game involving the network-based system is such that the game entity can continue to reside engaged in the game notwithstanding cessation of communication between the player device and the network-based system.

25 4. An arrangement according to claim 3, wherein upon cessation of communication between the player device and the network-based system, the game entity resides in the game in a dormant state in which, at least for a period following said cessation of communication, the game entity cannot be interacted with by other game entities participating in the game.

30

5. An arrangement according to claim 1, further comprising:

  -   storage means for storing a tournament-valid set of attributes for the game entity, this
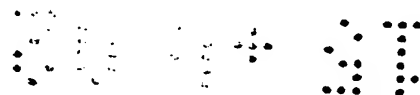
set of attributes being used to determine characteristics of the game entity during valid tournament games;

- attribute-modifying means for modifying attributes of said tournament-valid set in response to experiences of said game entity in valid tournament games only.

5

6. An arrangement according to claim 5, wherein the storage means is operative to store one or more additional sets of attributes for the game entity, the player device being operative to permit the game entity to be engaged in a game that is not a valid tournament game and to use a said additional set of attributes to determine characteristics of the game

10 entity during such a game, said attribute modifying means being operative to modify this additional set of attributes in response to experiences of the game entity in that game.

7. An arrangement according to claim 1, wherein the network-based system is associated with a wireless LAN with which the player device can communicate by wireless means.

15

8. Apparatus for playing a virtual game comprising:

- storage means for storing a set of attributes for a virtual game entity;
- control means for enabling a user to engage said virtual game entity in a game, control it during the game and disengage it from the game;

20 - communication means for communicating with different external systems to enable the game entity to be engaged in respective games involving those systems, at least one said external system providing in cooperation with the control means of the apparatus a game in which said game entity can only be disengaged from the game under certain conditions not including cessation of communication between the

25 apparatus and that external system;

- status means for indicating whether said game entity is currently disengaged from any game; and
- attribute-modifying means for modifying said attributes in response to experiences of said game entity in a game that was engaged in only after the game entity had been

30 disengaged from any earlier-engaged game.
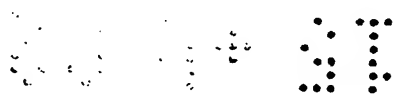
Amendment to the claims have been filed as follows

CLAIMS

1. An arrangement for enabling a virtual game entity to be engaged in a succession of virtual games that are valid games of a game tournament, the arrangement comprising:

5   -   player devices each arranged to enable a player to communicate with external game systems to engage a locally-stored virtual game entity in a game, control it during the game and disengage it from the game, each player device constituting a said external game system for the other player devices, and each device including storage means for storing a tournament-valid set of attribute values for the game entity with the

10   player device being arranged to use these attribute values to determine characteristics of the game entity during valid tournament games;

   -    a network-based external game system with which each player device can communicate to engage the game entity in a valid tournament game from which it can only be disengaged under certain conditions not including cessation of

15   communication between the device and the network-based system; and

   -    attribute-value modifying means for modifying said tournament-valid set of attribute values of the game entity of each player device in response to experiences of said game entity in valid tournament games only;

each player device being operative whilst the game entity has not been disengaged from a

20 valid tournament game involving the network-based system, either not to engage said game entity in a different game with another external system or not to treat that game as a valid tournament game.

2. An arrangement according to claim 1, wherein upon cessation of communication

25 between the player device and the network-based system, the game entity resides in the game in a dormant state in which, at least for a period following said cessation of communication, the game entity cannot be interacted with by other game entities participating in the game.

30 3. An arrangement according to claim 1, wherein the attribute-value modifying means comprises, in each player device, respective device-based attribute-value modification means for modifying the tournament-valid set of attribute values of the game entity of that

player device in response to experiences of the game entity when engaged in valid tournament games only, the device-based modification means being operative to effect attribute-value modification at least for valid tournament games played directly with other player devices.

5

4. An arrangement according to claim 3, wherein the attribute-value modifying means further comprises, in the network-based external game system, network-based attribute-value modification means, for modifying said tournament-valid set of attribute values of a game entity of a player device in response to experiences of said
10   game entity, when engaged in valid tournament games involving the network-based system.

5. An arrangement according to claim 1, wherein the storage means of each player device is operative to store one or more additional sets of attribute values for its game entity, the
15   player device being operative to permit the game entity to be engaged in a game that is not a valid tournament game and to use a said additional set of attribute values to determine characteristics of the game entity during such a game, said attribute-value modifying means being operative to modify this additional set of attribute values in response to experiences of the game entity in that game.

20

6. An arrangement according to claim 1, wherein the network-based system is associated with a wireless LAN with which the player device can communicate by wireless means.

Application No: GB 0202135.0   **Examiner:** Brendan Donohoe

Claims searched: 1-7   **Date of search:** 30 July 2002

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

    UK Cl (Ed.T): A6H HLM

    Int Cl (Ed.7): A63F; G06F; H04L

Other: Online Patent Databases: WPI, EPODOC, PAJ
         Internet: General keyword search

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
A	US 6119229 A	(MARTINEZ) - See especially column 11 line 58 - column 12 line 15.	
A	US 6117011 A	(LVOV) - See especially column 4 lines 7-12, and column 9 lines 32-38.	
A	US 5984787 A	(REDPATH) - See especially column 2 line 63 - column 4 line 19.	
A	US 2001/0039211 A1	(YOSHIZAWA) - See especially paragraph 0040.	
A	US 2001/0031654 A1	(WALKER) - See especially paragraphs 0071 & 0072, and 0096 - 0104.	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.